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the tribes and genera; and in the body of the work each generic description is followed by a table of the species when the genus contains more than one.

The second of these systematic works is "A Monograph of the Aphodiini inhabiting the United States," by Dr. George H. Horn.¹ In this monograph eighty-two species are enumerated. Each species is fully described, and synoptic tables for separating them are given. The work is done in the careful manner characteristic of Dr. Horn's writings. It is based on practically a complete series of specimens. Only two of the species are unknown to Dr. Horn, and all but four are in his cabinet. The descriptions are so definite that specimens can be determined from them with certainty.

From the Department of Agriculture at Washington we have received the annual report for 1886, containing the report of Dr. Riley as entomologist; and from the same source we have received Bulletins Nos. 13, 14, and 15 of the Division of Entomology. The more important of the topics discussed in these reports are the following: "The Cottony Cushion-Scale," which is doing great injury in California; "The Southern Buffalo-Gnat," "The Fall Web-Worm," and "Insects Injurious to Wheat."

A considerable amount of literature on the *Coccidæ* has appeared recently. In addition to Dr. Riley's reports on the Cottony Cushion-Scale, Miss Ormerod publishes a pamphlet on the same insect, entitled "Notes on the 'Australian Bug' in South Africa." In the *Transactions of the New Zealand Institute* Mr. Maskell publishes an article "On the 'Honeydew' of Coccidæ and the Fungus accompanying these Insects," and from the press of the Government Printer at Wellington there has just been issued a volume by Mr. Maskell on the "Scale Insects of New Zealand." This is illustrated by twenty-three plates, nearly all of which are colored.

In Bulletin No. 2 of the State Entomologist of Illinois Professor Forbes treats of "The Present Condition and Prospects of the Chinch-Bug in Illinois."

ZOOLOGY.

Sense Organs of Turbellarians.—Dr. L. Böhring has recently published (*Zool. Anzeiger*, 260) a preliminary account of the eyes, etc., of several species of planarians. In *Planaria gonocephala* each eye consists of a nervous apparatus and a pigment-layer, and the latter, unlike the eyes of Lang's Polyclada, consists of many nucleated cells united. The cavity of this pigment-layer is filled with end organs, each of which has a complicated structure, though this whole apparatus has previously been described

¹ Trans. Am. Ent. Soc., vol. xiv. p. 1-110.

as a hyaline, structureless formation. Each end organ connects with a nerve-fibre, which in turn leads back to a unipolar cell of the optic ganglion. No lens is to be recognized in the sections. In *Vorticerus auriculatus* the two eyes (which lie directly on the brain) have the optic cavity divided into two chambers by a middle pigmented wall. Each cavity is filled by fine rods, leaving a central canal free. Around the margin of the capsule are numerous cells, which resemble ganglion-cells, and which send fibres to the rods, and hence are regarded as retina-cells.

A Parasitic Rotifer.—Nearly twenty years ago E. Ray Lankester briefly described and roughly figured a rotifer, which he found parasitic in the body-cavity of *Synapta* from the Island of Guernsey. Recently Dr. Zelinka has found the same form in the Adriatic, and describes it as *Discopus synaptæ* nov. gen. et sp. According to the latter author this is not an endo-parasite, but lives in folds of the skin of the *Synapta*, and from these large numbers may be taken by a pipette. The animal belongs to the Philodinidæ. Zelinka has been able to stain and section these animals, and describes their internal structure in some detail. His conclusions are (1) that the bilobed wheel of the Philodinidæ can be homologized with the ciliated band of the trochosphere, (2) that the anterior end of the outstretched body is homologous with the "scheitelplatte," and (3) that the brain of the rotifer arises partly from separation from the scheitelplatte, and partly from immigration of primitively peripheral ganglion-cells.

The Genus *Sesarma*.—In 1818 Thomas Say described the genus *Sesarma* for a Floridan species of crab belonging to the Grapsoid group. Since that time numerous other species of the same genus have been described from all parts of the world, the latest list embracing seventy-one nominal species, the limits and synonymy of which are in almost inextricable confusion. Lately (*Zoologische Jahrbuch*, ii. 1887) Dr. J. G. de Man has attacked the Indo-Pacific species of the genus, and introduced some order into their classification. He divides the genus into four groups, based upon the character of the upper margin of the hand and the teeth of the margin of the carapax. He also regards the genus *Sarmatium* of Dana as of sub-generic value. In the same paper he further includes the results of a study of the Crustacean types of Hess and Nauck, by which a large number of nominal genera and species are thrown into synonymy.

Preliminary Notes on the Osteology of *Alosa sapidissima*.—In the shad the muscle of the lateral line is very largely developed, and extends down quite deeply between the dorsal and ventral masses of the lateral muscles. In the connective tissue

between the segments of the muscle of the lateral line a series of vertical cartilaginous plates are developed, extending backward and outward. They are irregularly triangular in outline, and the apex of the triangle, which is directed forward and inward, overlaps the distal extremity of the epicentrale. These cartilages seem to be evidence that a process of differentiation is going on in the shad similar to that which resulted in the differentiation of the sense organs of the head, and give support to the theory that these are derived from integumentary sense organs allied to those of the lateral line.

A consideration of their relation to the other skeletal elements of the abdominal segments suggests that the foremost visceral arches are not homologous with the branchial arches, but may belong to a series including the extra-branchials of Parker, the scapula portion of the pectoral arch, and the epipleurals.

They also suggest an origin for the free portion of the paired limbs from a ventro-lateral series of sensory organs, similar to those seen in amphibian larvæ which lie in a line connecting the fore and hind limbs.

Such a development might afford some explanation of the cephalic fin present in some elasmobranch fish either as a survival, or a reversion.—*Fanny R. M. Hitchcock.*

TO THE EDITORS OF THE NATURALIST:

SIRS,—Owing to the failure of the corrected revise to reach the publishers, my article, "Remarks on Classification," in the October number, requires some comment:

1. On page 915, last paragraph, the words *neither tubular nor even grooved* should be *never tubular*.

2. Near the bottom of the Table, the equivalent of *Stereoneura* should be "*invertebrates*"—*tunicates*.

3. At about the middle of the Table, under *Monocœlia* and *Polycoœlia*, the words *axon unsegmented* and *axon vertebrated* should be omitted.

4. On page 915, in the last line of the second paragraph, *will* should be *may*.

5. In several places the words *centre* and *synonyme* should be *center* and *synonym*. While the forms imposed by the publishers are sanctioned by Worcester, I prefer to follow Webster, as with *pseudonym*, *theater*, *meter*, etc. So long, indeed, as these two words and *center* are pronounced by all English speakers in two syllables, there seems to be no more reason for retaining the French orthography than in the case of *chambre*, which is always Anglicized as *chamber*.

BURT G. WILDER.

ITHACA, N. Y., October 29, 1887.

Zoological News.—**Cœlenterates.**—Mr. Richard Rathbun catalogues, with notes, the species of the genus *Madrepora* in

the United States National Museum. This collection is rich in type specimens of corals, containing, as it does, those which formed the bases of both Dana's and Verrill's descriptions of two large American exploring expeditions. In all fifty-nine species are enumerated. Later in the same volume he does the same work for the species of *Porites* and *Synaræa*. Twenty-three species of *Porites* (including *P. branneri* nov.) and three of *Synaræa* are included.

WORMS.—Fletcher and Hamilton describe, in a recent paper, fourteen new species of Land Planarians from Australia. Some of these have two eyes, and are referred to Leidy's genus *Rhynchodemus*. Some of their specimens agree well with species belonging to Moseley's genus *Cænoplana*, except that they have well-developed eyes,—a fact which leads them to regard that genus as synonymous with *Geoplana*.

VERTEBRATES.—Dr. Giglioli, of the Royal Museum of Florence, describes (*Zool. Anzeiger*, No. 261) a new species of *Cercopithecus* from Central Africa. It belongs to Schlegel's sixth group of the genus, and is allied to *C. leucampyx*, etc. It is named *C. boutourlinii*.

In the same journal (*Zool. Anzeiger*, No. 261) Dr. C. Zelinka notices a strange instance of batrachian teratology. In the urinary bladder of a specimen of *Salamandra maculata* he found a normal larva of the same species, pigmented, and two and one-half centimetres in length.

Mr. Charles H. Townsend contributes a series of valuable field-notes on the mammals, birds, and reptiles of Northern California to the *Proceedings U. S. National Mus.* for 1887. Among the more important points brought out are notes on the teratology of the antlers of *Cariacus columbianus*, and on the habits of the porcupine. He says that skunks killed as directed by Baird—caught in a box-trap and drowned—do not discharge their fluid as when killed in other ways.

F. W. True describes a new bat (*Vespertilio longicrus*) from Puget Sound in the *Proc. Nat. Mus.* for 1887, and in the same place gives cranial characters which he regards as distinctive of the Canada lynx.

Jordan and Evermann give a review of the food-fishes of Indiana in the last Agricultural Report of that State. Out of the hundred and fifty species but about fifty ever appear in the markets as food-fishes. The lake-sturgeon is said to spawn in the rivers in June, the red-horse in May,—points of interest to those who are studying Teleost embryology.

Francis Day describes (*Proc. Zool. Soc. London*, 1887) a supposed hybrid between the pilchard and the herring, the scales and coloring of the two sides of the body presenting the characters of each of the parent species respectively. The same

author has a paper on the Loch Leven trout in the *Journal of the Linnean Society* for this year. He does not, however, come to any decision as to the specific validity of the form in question.

Prof. E. D. Cope describes (*Proc. U. S. Nat. Mus.*, 1887) a new species of *Tropidonotus*, from Washington, D. C., under the name *T. bisectus*. In its affinities it is nearest to *T. woodhousei*, and the fact that it occurred in a region so carefully studied lends plausibility to the view that it is an introduced species.

Dr. van Lidth de Jeude contributes some notes on a collection of fishes and reptiles from the West Indies to vol. x. of the Leyden Museum *Notes*. The new species described are *Gymnodactylus antillensis*, *Phyllodactylus martini* (= *P. julieni* Cope), *Cnemidophorus arubensis*, *Crotalus horridus* var. *unicolor*, *Pœcelia vandepolli*, and same var. *arubensis*. A larger acquaintance with American literature would have reduced the number of nominally new species.

EMBRYOLOGY.*

Development of the Cœcilians (*Ichthyophis glutinosus*).²—The remarkable discoveries of the brothers Sarasin during their sojourn in Ceylon are now in course of publication, and promise to clear up some very important questions in morphology and taxonomy. This is the case with the memoir before us.

After surmounting many discouraging difficulties, the Sarasins have succeeded in presenting a pretty full account of the development of the remarkable, worm-like, limbless salamanders of the genus *Ichthyophis*. The ova are laid in strings, joined together by continuations of the egg-membrane, so as to remind one of a string of beads. The individual ova are quite large, or nearly the size of a marrow-fat pea. There is a considerable albuminous investment to each ovum, and at the points where the ova are joined together there is a well-defined chalaza developed at opposite poles, these chalazæ seeming to join adjacent ova together through the narrow tubular connections formed by their common coverings. The female guards her ova in a burrow, and not the least charming feature of this memoir is the skill with which the famous zoological artist Mützel has succeeded in giving a most spirited rendering of the animal in its burrow coiled about its ova. This effective picture has been composed from photographs taken from life by the authors.

On account of the very large size of the ovum the mode of development differs very considerably from that of other Amphibia, in that a very distinct blastoderm is formed, which slowly invests by epiboly the underlying yolk, as in Elasmobranchs, Reptilia, Teleostei, and Aves. The formation of the embryo

* Edited by JOHN A. RYDER, Ph.D., Biological Department, University of Pennsylvania.

² *Ergebnisse naturwissenschaftlicher Forschungen auf Ceylon*. Heft II., 4to. Wiesbaden, 1887. Kreidel.